Commission. The paper presents the most complete summary of the Alaskan boundary dispute thus far made. Mr. Foster states that the dispute really dates from 1898, when it was presented without previous warning before the Joint High Commission which had assembled in Quebec. A number of maps which are offered as testimony show that on all the principal English maps the boundary line is as given on the American maps. Professor Alfred P. Dennis concludes his description of 'Life on a Yukon Trail,' begun in the October number. An article by Professor W. M. Davis, of Harvard University, on 'The Rational Element in Geography,' is the first of a series on methods of teaching and studying geography. There has been a steadily growing demand in the last few years for the better teaching of geography, and as earnest an effort on the part of many teachers to meet that demand. The *National Geographic Magazine* proposes to aid the work by presenting in its pages a series of articles by those most fitted to speak—able geographers who are also teachers of renown. The article by Professor Davis will be followed by a second from him on field and laboratory methods of teaching geography. Commissioner Harris, of the Bureau of Education, will treat the subject in several of its aspects, and a number of other equally prominent educators have promised articles which are to appear in the magazine within the next few months.

THE Chicago University Press has added to its publications the *Manual Training Magazine*, the first number of which was issued on October 1st. It is edited by Mr. Charles A. Bennett, of the Bradley Polytechnic Institute, Peoria.

SOCIETIES AND ACADEMIES.

THE NEW YORK ACADEMY OF SCIENCES.

SECTION OF ASTRONOMY AND PHYSICS.

THE first meeting since the spring of the Section was held on 2d October, 1899, at 12 West 31st Street. Professor William Hallock read a paper on 'Compound Harmonic Vibrations of a String.' He said that some German experimenters have determined experimentally by photography the motions of different points of a vibrating string. The vibration varies, of course, according to the part of the string bowed, the speed, the kind of bow, etc. His paper, however, consisted essentially of a set of curves, calculated from the theoretical formulæ, showing the successive positions of a string vibrating under the influence of a fundamental and the first seven overtones. Each curve shows the position of the string at a particular instant. Sixteen such curves are shown for the first sixteen sixty-fourths of a complete period of the fundamental. The amplitude of the component is proportional to the wave-lengths, in each case. Thirty-two points were computed for each curve. Each curve is computed from the formula

$$y_1 = a \sin 2\pi \frac{t_1}{T_1} \sin 2\pi \frac{x_1}{l_1}$$
$$+ b \sin 2\pi \frac{t_1}{T_2} \sin 2\pi \frac{x_1}{l_2} + \text{etc.} \cdots$$
$$+ h \sin 2\pi \frac{t_1}{T_8} \sin 2\pi \frac{x_1}{l_8},$$
$$a = 2b = 3c = 4d = 5e = 6f = 7g = 8h,$$
$$T_1 = 2T_2 = 3T_3 = 4T_4 = 5T_5 = 6T_6 = 7T_7 = 8T_8.$$

In the discussion Professor Pupin said that it would be interesting to photograph the vibration of a string loaded, and also unloaded. Such a study might help our theories of electrical waves along a cable.

WM. S. DAY,
Secretary.

SECTION OF GEOLOGY AND MINERALOGY.

AT the meeting of October 16th, after Mr. Geo. F. Kunz, the Chairman, had exhibited certain specimens, the regular paper of the evening was presented by Professor J. J. Stevenson on 'The Section at Schoharie, N. Y.' The Schoharie Valley is an indentation in the Helderberg Mountains, about 35 miles southwest from Albany, N. Y. It is of interest as showing a section from the Hudson to the Hamilton, with almost continuous exposures at various localities. This was examined during last summer with the view of making comparisons with conditions observed in parts of the Appalachian region within Pennsylvania and Virginia. There are some notable contrasts between the northern and the southern sections. At Schoharie, the Medina is wanting

and the greenish shales of Clinton rest on the Hudson. In southern Pennsylvania and in Virginia, the red and white Medina are both present and Hudson forms pass upward into the red Medina, occurring abundantly in southwest Virginia in a bed only 100 feet below the white Medina. At Schoharie, the Niagara is differentiated physically from the overlying Waterlime, but much of the Niagara fauna passes into the Waterlime; in localities further west and south, the Salina shales intervene and there is no passage of fauna. The upper Waterlime at Schoharie differs greatly in color and composition from the Tentaculite or lower divisions of the Helderberg, but at least two forms, most characteristic of the Tentaculite, are found in the upper Waterlime. These forms were not observed by the writer in the Waterlime of southern Pennsylvania. The several sub-divisions of the Helderberg are very distinct physically, the boundaries of each being sharply defined; but the physical changes were such as to cause only gradual disappearance of the several faunas and forms, which persist throughout, showing little variation. The passage from Helderberg to Oriskany, at Schoharie, is abrupt to the last degree—from a very good limestone to a ferruginous and only slightly calcareous sandstone. The faunal change is as abrupt as the physical. Here again the contrast is very great, for, in southern Pennsylvania, the passage from Helderberg to Oriskany is very gradual through a silicious limestone, containing forms belonging to each. In southwest Virginia the upper part of the Helderberg becomes silicious and in some localities is almost a sandstone.

In response to a request from the Chairman for notes on geological observations during the last summer, Professor Kemp reported on the progress of his geological survey of the Adirondack region. One result was the recognition of a true quartzite of pre-Cambrian date, affording thus a fragmental sediment. The sedimentary rocks in the region he found to be widely charged with graphite, indicating an abundance of organic life in pre-Cambrian time. Further types of eruptive rocks had also been identified, to fill up gaps in known series.

Professor Osborn related some results of a visit, with Dr. Matthews, to the Como Bluffs Section, south of the Union Pacific Railroad, three hours west of Laramie; the more certain establishment of its Jurassic character, with bed containing remains of Dinosaurus about 40 feet below the top (a fresh water deposit), while, in the marine beds below, belemnites and btanodon were found, the latter serving as nuclei for concretions. Professor Osborn also described the mode of occurrence of the mastodon recently found by a German, while digging in his market garden, three miles back of Newburgh, N. Y.

Professor R. E. Dodge gave a preliminary account of his work on the Pueblo ruins at Pueblo Bamlo, New Mexico. The deposits on which the ruins are situated seem to indicate a a very long occupation of the country previous to the desertion of the ruins.

Dr. A. A. Julien discussed the common distribution of opal or hyalite; and the exclusively recent character of all existing occurrences of this mineral.

Mr. Geo. F. Kunz described his recent visit to the ancient locality of jade (nephrite) at Jordaensmühl, near Breslau, Germany, with the special object of study of the minerals associated with jade. In an ancient quarry for road material, immense masses of zoisite-quartzite occurred, forming columns thirty feet in height.

Dr. Hovey presented some notes of an excursion with Professor Iddings to the Yellowstone Park.

ALEXIS A. JULIEN,
Secretary of Section.

THE CHEMICAL SOCIETY OF WASHINGTON.

THE regular meeting was held October 12, 1899.

The first paper was read by Mr. J. K. Haywood and was entitled, 'The Determination of Glycogen,' by J. K. Haywood and W. D. Bigelow.

The authors proved that methods for the estimation of glycogen, which depend on its direct inversion into dextrose, are unreliable and have modified the method of Brücke so as to make it accurate and fairly rapid.

The second paper was read by Dr. F. K. Cameron and was entitled, 'A Method for Estimating Black Alkali in Soils.'

The method enables the determination of the degree of hydrolization of the sodium carbonate in soils and soil crusts containing this compound. It was shown that an accurate determination of the amount of sodium carbonate could not be made by titrating directly with a standard acid, two reactions taking place with the formation of the acid carbonate in varying quantities and furthermore the probable existence of acid carbonate in the soil adds to the difficulty of such a determination. It was shown that acid potassium sulfate is free from these objections, the reaction taking place with quantitative exactness according to this equation:

$$Na_2CO_3 + HKSO_4 = NaHCO_3 + NaKSO_4$$

both substances indicated in the right member of the equation being neutral. It should be borne in mind that acid sodium carbonate although a neutral substance towards indicators, quite rapidly and readily inverts with the formation of the alkaline normal carbonate, so that a reasonable degree of speed must be used in making the titration.

Details of the practical application of the method with examples from practice, were given, and it was shown that in ordinary practice the method was easily capable of an accuracy indicated by a probable error of less than 0.02 of 1 per cent.

The last paper was read by Dr. H. W. Wiley, and was entitled, 'The Fifteenth Annual Meeting of the Association of Official Agricultural Chemists, at San Francisco, July 5–7, 1899.'

Mr. Tassin exhibited a specimen of calcium chlorid which he had obtained from a muck soil found in Utah. The soil occurs as an incrustation between Salt Lake City and Salt Lake.

Dr. Bolton exhibited a bibliography of thallium compiled by Miss Martha Dunn and recently published by the Smithsonian Institution. He called attention to the work done in Paris by Jules Garcon, who has published a bibliography of the 'Chemical Technology of Textile Fibers,' and a pamphlet entitled, 'Resources of Bibliography of Chemistry.' The latter consists of a list of chemical bibliographies.

WILLIAM H. KRUG,
Secretary.

ONONDAGA ACADEMY OF SCIENCE.

THE September meeting was devoted to ornithology. Mr. J. A. Dakin spoke on the subject from an economical standpoint, and expressed the belief that the slaughter of birds for ornamentation is a chief factor in the destruction of farm crops by insects. Dr. W. M. Beauchamp considered forest denudation and changed food habits a more important factor.

Principal J. D. Wilson spoke on the study of birds from a naturalist's rather than a collector's standpoint, citing instances of familiarity between birds and their human friends and also his own experiences in taming young wild birds and studying their habits.

Mr. A. Perrior read a paper on 'The Oneida Lake Heronry.' In the tall trees of a submerged swamp at the north of Oneida Lake about five hundred pairs of Great Blue Herons (*Ardea herodias*) congregate annually at the breeding season. The nests are two or three feet in diameter and composed of half-inch sticks lined with finer twigs. Frequently two or three, and occasionally four, nests are built in the same tree, and are used indefinitely, being repaired from year to year. Mr. Perrior exhibited specimens of birds and eggs and also photographs taken among the tree tops.

At the October meeting Professor Hargitt spoke on the recent appearance in the county of the periodic *Cicada septendecim*, Riley's Brood No. XIX. The visitation lasted only about a month, was confined to parts of the towns of Onondaga and Dewitt and less damage was done than anticipated. The English sparrows were observed to feed greedily on the Cicadas, migrating in large numbers to the woods southeast of Syracuse. The brood is probably growing smaller in this county. Dr. Beauchamp confirmed the rumors of the Onondaga Indians feasting on the Cicadas and called attention to the restricted area of visitation, the Cicadas being confined to the central towns of the county.

Mr. H. W. Britcher spoke briefly on 'Protective Habits and Resemblances of Onondaga County Spiders,' and exhibited a number of live specimens illustrating the cases cited.

H. W. BRITCHER,
Corresponding Secretary.